

## *Noise Analysis Report*

# San Diego Freedom Ranch Expansion Campo, CA

MUP P74-011W Modification  
Major Pre-Application (MPA) 10-018  
[Case Number 3301 74-011-07](#)  
[Environmental Log No. 12-21-002](#)

February 28, 2012  
[Revised December 10, 2012](#)

*Prepared for:*  
The County of San Diego  
&  
San Diego Freedom Ranch Inc.  
1777 Buckman Springs Road  
Campo, CA 91906

*Prepared by:*  
Steve Fiedler  
Kimley-Horn and Associates, Inc.  
401 B Street, Suite 600  
San Diego, CA 92101

095871000

---

<b>Executive Summary .....</b>	<b>1</b>
<b>1.0 Introduction .....</b>	<b>2</b>
1.1 Project Description .....	2
1.2 Environmental Noise Background .....	4
1.3 Applicable Noise Regulations and Standards .....	7
1.4 Environmental Settings and Existing Conditions.....	12
1.5 Methodology and Equipment.....	12
<b>2.0 Noise Sensitive Land Uses .....</b>	<b>15</b>
2.1 Guidelines for the Determination of Significance.....	15
2.2 Potential Noise Impacts .....	16
<b>3.0 Project-Generated Airborne Noise .....</b>	<b>19</b>
3.1 Guidelines for the Determination of Significance.....	19
3.2 Potential Operational Noise Impacts (Non-Construction Noise) .....	20
3.3 Construction Activities .....	22
3.4 Potential Noise Impacts .....	22
3.5 Conclusions.....	23
<b>4.0 Summary of Project Impacts, Mitigation, and Conclusions .....</b>	<b>25</b>
4.1 Project Features .....	25
4.2 Noise Sensitive Land Uses .....	25
4.3 Project-Generated Airborne Noise .....	25
<b>5.0 References.....</b>	<b>26</b>
<b>6.0 List of Preparers.....</b>	<b>27</b>

---

## Tables

Table 1. Sound Levels of Typical Noise Sources and Noise Environments .....	6
Table 2. Sound Level Measurements (dBA).....	13

## Figures

Figure 1. Vicinity Map .....	3
Figure 2. Measurement Locations .....	14
Figure 3. Roadway Noise Levels (CNEL).....	17
Figure 4. Project-Generated Operational Noise Levels (Leq).....	21
Figure 5. Project-Generated Construction Noise Levels (Leq).....	24

## Appendices

Appendix A. Major Use Permit Sheet Set
Appendix B. Roadway Noise Calculations
Appendix C. Mechanical Equipment

---

## **EXECUTIVE SUMMARY**

The proposed San Diego Freedom Ranch Expansion project would add five dormitories and a dining hall in phases to an existing residential alcohol and drug treatment and recovery facility in the Campo community of unincorporated San Diego County.

All noise-sensitive areas on the project site would be exposed to offsite traffic noise levels less than 60 dBA CNEL, in compliance with the Noise Element of the General Plan.

Project operation noise levels would be below 45 dBA Leq at property lines, in compliance with the Noise Ordinance.

Project construction noise levels would be below 75 dBA Leq (8-hour) at the project property lines, in compliance with the Noise Ordinance.

No significant impacts were identified. The methodology and findings of this analysis are discussed in the following pages.

---

## 1.0 INTRODUCTION

This report assesses potential noise impacts associated with the proposed San Diego Freedom Ranch Expansion project in Campo, California (Figure 1).

### 1.1 Project Description

#### Program Description

The San Diego Freedom Ranch was originally established in 1972. Legal structure of the organization followed, and in 1976 it incorporated into a private, non-profit 501(c)3, 50-bed men's residential alcohol and drug treatment and recovery facility that is licensed and certified through the State of California. The program consists of highly structured educational groups, one-on-one discussions with staff and involvement in the 12-Step program of Alcoholics Anonymous and Narcotics Anonymous. There are eight paid staff and three volunteer staff. Five of the staff live on site. The program length is normally 90-120 days depending on the needs of the individual.

The Ranch also has other events and activities, such as social, recreational and community help projects. The recreational facilities include weightlifting, horseshoes, and miniature golf. Some of our food comes from our garden and working pig farm. Transportation needs are usually met by taking the bus from the bus stop outside the front door. Passes are only granted infrequently, so there is no need for residents to have personal vehicles at the Ranch. Living quarters are bunkhouse style, with 6-10 residents per room.

#### Existing Facility

The existing 50-bed San Diego Freedom Ranch facility is located on four acres. The main building contains a dormitory, the kitchen, and the dining room. Over the years, three additional small adjoining parcels of land were added to the Ranch's ownership. A six-bed residential facility and a five-bed transitional facility are located on these parcels. In 2009, 90 acres were acquired providing a site totaling 112.6 acres. Refer to Appendix A for details.

#### Proposed Expansion

The San Diego Freedom Ranch proposes to expand the existing facilities to provide services for up to 125 men. This expansion would occur over a period of time. Phase 1 includes construction of a dormitory for 25 men. Phase 2 includes construction of a dining hall and a second 25-bed dormitory. Phase 3 includes construction of a third 25-bed dormitory and a fourth 25-bed dormitory, removal of the existing staff quarters building, and interior repurposing of the existing main building to staff quarters and administration. Phase 4 includes removal of the existing six-bed residential facility and five-bed transitional facility, and construction of a 25-bed transitional / sober living facility. Refer to Appendix A for details.



NOT TO SCALE

---

## 1.2 Environmental Noise Background

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. The human environment is characterized by a certain consistent noise level which varies by location and is termed ambient noise. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in cycles per second, or hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. The average person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness; this relation holds true for sounds of any loudness. Sound levels of typical noise sources and environments are provided in Table 1.

Because of the logarithmic nature of the decibel unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. A simple rule is useful, however, in dealing with sound levels. If a sound source generating a sound level is added to another sound source generating the same sound level, the resultant sound level increases by 3 dB, regardless of the initial sound level. Thus, for example,  $60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}$ , and  $80 \text{ dB} + 80 \text{ dB} = 83 \text{ dB}$ .

The normal human ear can detect sounds that range in frequency from about 20 Hz to 20,000 Hz. However, all sounds in this wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the range of 1,000 Hz to 4,000 Hz. This frequency dependence can be taken into account by applying a correction to each frequency range to approximate the human ear's sensitivity within each range. This is called A-weighting and is commonly used in measurements of community environmental noise. The A-weighted sound pressure level (abbreviated as dBA) is the sound level with the "A-weighting" frequency correction. In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Because community noise fluctuates over time, a single measure called the Equivalent Sound Level ( $L_{eq}$ ) is often used to describe the time-varying character of community noise. The  $L_{eq}$  is the energy-averaged A-weighted sound level during a measured time interval. It is equal to the level of continuous steady sound containing the same total acoustical energy over the averaging time period as the actual time-varying sound. Additionally, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the  $L_{max}$  and  $L_{min}$  indicators, which represent the root-mean-

---

square maximum and minimum noise levels obtained during the measurement interval. The Lmin value obtained for a particular monitoring location is often called the “acoustic floor” for that location.

To describe the time-varying character of environmental noise, the statistical noise descriptors L10, L50, and L90 are commonly used. They are the noise levels equaled or exceeded during 10, 50, and 90 percent of a stated time, respectively. Sound levels associated with L10 typically describe transient or short-term events, whereas levels associated with L90 describe the steady-state (or most prevalent) noise conditions.

Another sound measure known as the Community Noise Equivalent Level (CNEL) is an adjusted average A-weighted sound level for a 24-hour day. It is calculated by adding a 5 dB adjustment to sound levels during evening hours (7:00 p.m. to 10:00 p.m.) and a 10 dB adjustment to sound levels during nighttime hours (10:00 p.m. to 7:00 a.m.). These adjustments compensate for the increased sensitivity to noise during the typically quieter evening and nighttime hours. CNEL is used by the State of California and County to evaluate land-use compatibility with regard to noise.

**Table 1. Sound Levels of Typical Noise Sources and Noise Environments**

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud Threshold of Pain
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud Very Loud
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Noisy Urban Daytime	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)	Commercial Areas	70	Reference Loudness Moderately Loud
Normal Speech (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud Quiet
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		0	1/64 as loud Threshold of Hearing

Source: Compiled by Kimley-Horn and Associates, Inc.

---

## 1.3 Applicable Noise Regulations and Standards

### 1.3.1 County of San Diego General Plan

The following is taken from the Noise Element of the County General Plan (County of San Diego 2011).

Noise exposure criteria are incorporated into land use planning to reduce future conflicts between noise and land use. This is achieved by specifying acceptable noise exposure ranges for various land uses throughout the County. The County uses the Noise Compatibility Guidelines listed in Table N-1 (Noise Compatibility Guidelines) to determine the compatibility of land use when evaluating proposed development projects.

The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments. For example, a commercial project would be evaluated differently than a residential project in a rural area or a mixed-use project in a more densely developed area of the County.

A land use located in an area identified as “acceptable” indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Land uses that fall into the “conditionally acceptable” noise environment should have an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with sleep, speech, or other activities characteristic of the land use. For land uses indicated as “conditionally acceptable,” structures must be able to attenuate the exterior noise to the indoor noise level as indicated in the Noise Standards listed in Table N-2 (Noise Standards). For land uses where the exterior noise levels fall within the “unacceptable” range, new construction generally should not be undertaken.

Table N-1 Noise Compatibility Guidelines							
Land Use Category		Exterior Noise Level (CNEL)					
		55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes						
B	Residential—multi-family residences, mixed-use (commercial/residential)						
C	Transient lodging—motels, hotels, resorts						
D*	Schools, churches, hospitals, nursing homes, child care facilities						
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries						
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation						
G*	Office\professional, government, medical\dental, commercial, retail, laboratories						
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair						
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.						
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.						
	UNACCEPTABLE—New construction or development shall not be undertaken.						

\* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

Table N-2 Noise Standards <sup>Note</sup>	
1.	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2.	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3.	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA $L_{eq}$ (one hour average).
4.	For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5.	For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6.	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7.	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8.	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9.	For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

Note: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table N-1, Noise Compatibility Guidelines.

In addition, the County has adopted community noise control standards as part of the County's Noise Abatement and Control Ordinance (County Code of Regulatory Ordinances, Title 3, Division 6, Chapter 4) and provides guidance for implementation of the County's noise policies and ordinance in the County's California Environmental Quality Act (CEQA) Guidelines for Determining Significance for Noise. The Noise Ordinance defines limits for activities that generate excessive noise and sets noise level limits for land uses. The County's CEQA significance guidelines provide guidance on the use of the General Plan Noise Element and the County Noise Abatement and Control Ordinance when considering the environmental impact of noise exposure to high or excessive noise levels.

### 1.3.2 County of San Diego Noise Ordinance

Section 36.404: General Sound Level Limits states:

- (a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

#### **San Diego County Code Section 36.404, Sound Level Limits in Decibels (dBA)**

<b>ZONE</b>	<b>TIME</b>	<b>ONE-HOUR AVERAGE SOUND LEVEL LIMITS (dBA)</b>
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) R-RO, R-C, R-M, S-86, V-5 and R-V and R-U with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S-94, V-4 and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2	7 a.m. to 7 p.m.	60
	V1, V2 7 p.m. to 10 p.m.	55
	V1 10 p.m. to 7 a.m.	55
	V2 10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M-50, M-52 and M-54	Anytime	70
(6) S-82, M-56 and M-58	Anytime	75
(7) S-88 (see subsection (c) below)		

- (b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those noise mitigation measures reduce potential impacts to a level

---

below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.

- (c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 36.404 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52, or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.
- (d) If the measured ambient noise level exceeds the applicable limit in Table 36.404, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.
- (e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.
- (f) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section, measured at or beyond six feet from the boundary of the easement upon which the facility is located.

Section 36.409: Sound Level Limitations on Construction Equipment states:

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

The project site and all adjacent properties are zoned S-92: General Rural Use Regulation. Therefore, the property line noise level limits applicable to the project are 50 dBA Leq during daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA Leq during nighttime hours of 10:00 p.m. and 7:00 a.m.

### 1.3.3 State of California

California Code of Regulations, Title 24: Noise Insulation Standards requires an acoustical analysis for multifamily dwellings, hotels, motels, dormitories, long-term care facilities and dwellings other than detached single-family dwellings (i.e., noise sensitive interior areas) located in an area with exterior noise levels exceeding 60 dBA CNEL. The analysis must show that the proposed design would limit interior noise in habitable rooms to 45 dBA CNEL or below. This analysis must be provided to the County's Building Inspection Department.

---

The interior noise analysis should identify sound transmission loss requirements for building elements exposed to exterior noise levels exceeding 60 dBA CNEL. If the interior 45 dBA CNEL limit can be achieved only with the windows closed, the residence design must include mechanical ventilation that meets applicable Uniform Building Code (UBC) requirements. Worst-case noise levels, either existing or future, must be used. Future noise level predictions must be for a date at least 10 years from the time of the building permit application. The County has applied the 45 dBA CNEL limit to noise sensitive areas, such as sleeping areas in the facility.

## **1.4 Environmental Settings and Existing Conditions**

### **1.4.1 Settings and Location**

The project site is located along the east side of Buckman Springs Road, north of Phelps Road, in the community of Campo, an unincorporated area of San Diego County. Zoning for the site and all adjacent properties is S92: General Rural Use Regulation. Surrounding land uses consist of open area to the east and low density residential to the north, south, and west. The project site is currently developed with various small structures, including a main facility building, a multi-purpose room building, a staff quarters building, a six-bed residential facility, and a five-bed transitional facility.

### **1.4.2 Existing Noise Conditions**

There are no significant onsite noise sources. The primary noise source in the project vicinity is vehicular traffic on Buckman Springs Road, a 2-lane Local Collector. The existing (2010) Average Daily Traffic (ADT) volume on Buckman Springs Road near the project site is 1,200 vehicles [SANDAG 2012]. The current speed is 55 miles per hour (mph). Phelps Road is unpaved.

## **1.5 Methodology and Equipment**

### **1.5.1 Noise Measuring Methodology and Procedures**

A noise measurement survey of the existing environment was conducted in the project area. Two 30-minute sound level measurements were conducted during the afternoon peak traffic period to quantify the ambient noise environment. The measurements were performed on Tuesday, January 31, 2012, between 3:20 p.m. and 4:40 p.m.

A RION Model NA-28 American National Standards Institute (ANSI) Type 1 Integrating Sound Level Meter was used as the data-collection device. The meter was mounted on a tripod roughly 5 feet above ground to simulate the average height of the human ear. The sound level meter was calibrated before and after the measurement period.

The measurement results are summarized in Table 2 and correspond to the locations depicted on Figure 2. Noise sources contributing to the noise environment during the measurement periods included vehicular traffic on Buckman Springs Road, distant aircraft, and domestic activity.

**Table 2. Sound Level Measurements (dBA)**

Site	Description	Date / Time	Leq	Lmin	Lmax	L10	L50	L90	Traffic
ML1	Eastern area (4 dorms & dining hall)	01/31/2012 15:20 – 15:50	48.0	30.4	61.4	52.2	45.0	36.3	Not counted
ML2	Southwestern area (Transitional facility)	01/31/2012 16:10 – 16:40	54.9	33.7	65.3	59.5	48.8	40.4	NB: 66 cars, 4 MT, 3 buses SB: 60 cars, 6 HT

Note:

MT = medium trucks, HT = heavy trucks

### 1.5.2 Noise Modeling Software

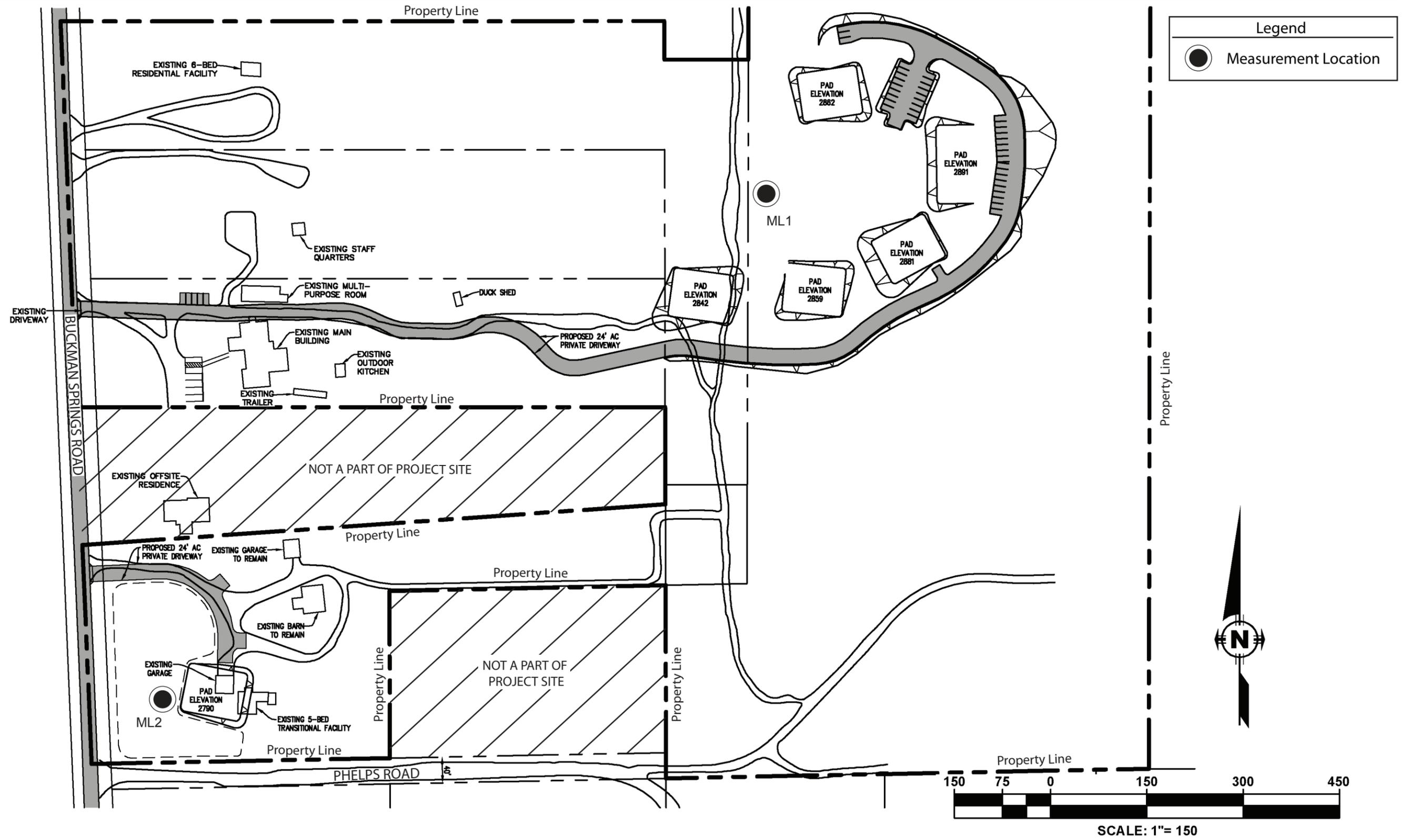
The Federal Highway Association (FHWA) Traffic Noise Model (TNM) version 2.5 was used to calculate traffic noise levels. The modeling effort considered roadway alignments, estimated average vehicle speed, peak-hour traffic volume, vehicle mix, and intervening topography and structures. The model used a default ground type of “loose soil.” The peak-hour traffic volume was assumed to be 10 percent of the ADT on each roadway. The model was calibrated using actual traffic counts and sound level measurements. Actual sound levels varied from projected sound levels by less than 1 dBA. The vehicular traffic calculations are summarized in Appendix [A.B](#).

### 1.5.3 Noise Calculations

Acoustical calculations were performed to estimate the sound level from point sources. Sound from a point source generally decays at a rate of six dBA per doubling of distance from the source. This is a logarithmic relationship describing the acoustical spreading of a pure, undisturbed spherical wave in air. The rule applies to the propagation of sound waves with no ground interaction. Sound levels were calculated using the formula

$$SPL_2 = SPL_1 - 20 \log \left( \frac{d_2}{d_1} \right) \quad \text{where}$$

$SPL_1$	=	known sound level,
$SPL_2$	=	desired sound level,
$d_1$	=	known distance, and
$d_2$	=	desired distance.



---

## 2.0 NOISE SENSITIVE LAND USES

### 2.1 Guidelines for the Determination of Significance

Project implementation will result in the exposure of any on- or off-site, existing, or reasonably foreseeable future NSLU to exterior or interior noise (including noise generated by the project, together with noise from roads [existing and planned Circulation Element roadways], railroads, airports, heliports, and all other noise sources) in excess of any of the following:

A. Exterior Locations:

- i. 60 dB (CNEL)<sup>†</sup>; or
- ii. An increase of 10 dB (CNEL) over pre-existing noise.

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

- |     |   |                     |
|-----|---|---------------------|
| (1) | Net lot area up to 4,000 square feet:       | 400 square feet     |
| (2) | Net lot area 4,000 square feet to 10 acres: | 10% of net lot area |
| (3) | Net lot area over 10 acres:                 | 1 acre              |

For all other projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

B. Interior Locations:

45 dB (CNEL) except for the following cases:

- i. Rooms which are usually occupied only a part of the day (schools, libraries, or similar facilities), the interior one-hour average sound level due to noise outside should not exceed 50 decibels (A).
- ii. Corridors, hallways, stairwells, closets, bathrooms, or any room with a volume less than 490 cubic feet.

<sup>†</sup> If any adopted community noise standard is more stringent than the exterior criterion of 60 decibels CNEL, the analysis of any related impacts due to this standard shall be considered a potential land use impact. The criteria listed in this document are still applicable in all environmental acoustical studies for compliance to CEQA.

---

## 2.2 Potential Noise Impacts

### 2.2.1 Onsite

#### 2.2.1.1 Exterior – Proposed Usable Open Spaces

The project would include four dormitories, a dining hall, and a transitional / sober living facility; the building pads are considered outdoor usable open spaces. The project would not include any other outdoor usable open spaces.

Noise from vehicular traffic would continue to be the primary noise source in the future. The future (~~2050~~2030) traffic volume on Buckman Springs Road near the project site is projected to increase to ~~2,000~~3,100 vehicles [~~SANDAG 2012~~County of San Diego 2010]. Buckman Springs Road is currently a Local Collector with a speed limit of 55 mph; no ~~widening~~ additional lanes or speed increase is planned. The vehicle mix was assumed to be 90% cars, 4% medium trucks, 3% heavy trucks, and 3% buses.

TNM was used to calculate future exterior traffic noise levels at the building pads. Calculations show that future exterior traffic noise levels at the proposed outdoor usable open spaces would range from below 50 dBA CNEL at the dormitories and dining hall to approximately ~~55~~ 57 dBA CNEL at the transitional / sober living facility. Refer to Figure 3 for further details. Because future exterior traffic noise levels at all proposed outdoor usable open spaces would be less than the standard set in the County General Plan, traffic noise impacts at outdoor usable open spaces are less than significant.

#### 2.2.1.2 Exterior – Generalized Noise Contours

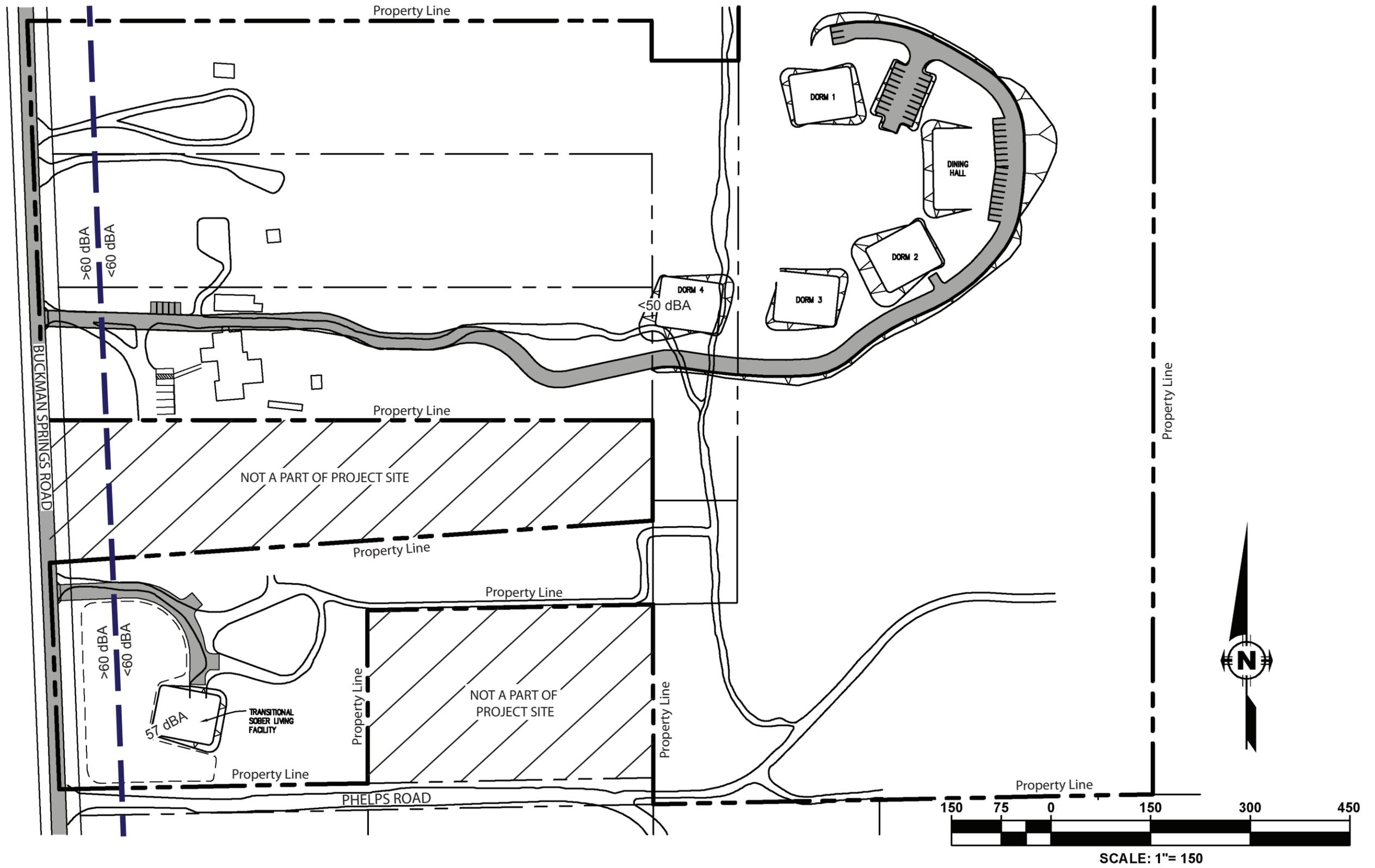
The future unmitigated 60 dBA CNEL noise contour distance was estimated using TNM, with no grading or intervening structures. The contour is approximately ~~75~~ 95 feet from the centerline of Buckman Springs Road, as shown on Figure 3.

#### 2.2.1.3 Interior

The project would include single-story dormitories and a transitional / sober living facility, which are considered multifamily dwellings. Future exterior traffic noise levels at the proposed building façades would range from less than 50 dBA CNEL at the dormitories to approximately ~~55~~ 57 dBA CNEL at the transitional / sober living facility. Refer to Figure 3 for further details. Because projected future exterior traffic noise levels do not equal or exceed 60 dBA CNEL at any proposed building façade, no interior noise analysis would be required. Interior noise impacts are less than significant.

#### 2.2.1.4 Design Considerations and Mitigation Measures

Design considerations include the locations of the project building pads as shown on Figure 3. No mitigation measures were necessary.



---

## 2.2.2 Offsite

The project site access roadway is Buckman Springs Road. There are scattered residences along Buckman Springs Road at varying distances to the roadway.

### 2.2.2.1 Direct Impacts

It is considered a significant direct impact when “new projects combine to generate more than double the existing sound energy of a documented noisy site.” A doubling of sound energy from a line noise source such as a roadway is represented by an increase of 3 dBA.

The project-specific traffic counts [Pacific Traffic Data Services 2010] of Buckman Springs Road and the Ranch access driveway indicate that the San Diego Freedom Ranch currently generates 47 ADT under the existing condition of a 50-bed facility. The project expansion of the Ranch to a 125-bed facility would therefore increase the project trip generation to 118 ADT.

However, in the interest of a worst-case analysis, the County-assumed project trip generation was used in the calculations. Under this assumption, the project would generate up to 375 ADT along Buckman Springs Road [County of San Diego 2011] for an existing plus project condition of 1,575 vehicles. TNM was used to estimate the project-generated noise increase from the existing noise level, using the roadway assumptions listed in Section 2.2.1.1. At 50 feet from the centerline, the existing noise level of 62 dBA generated by the existing ADT of 1,200 vehicles would increase to 63 dBA with the addition of the project traffic.

The project-generated traffic noise increase would be 1 dBA. Project-generated offsite traffic noise impacts at noise-sensitive land uses are less than significant.

### 2.2.2.2 Cumulatively Significant Impacts

It is considered a significant cumulative impact when project traffic combines with other permitted or planned projects to double the existing noise conditions.

The project traffic analysis did not identify cumulative traffic volumes from other permitted or planned projects. The year 2020 ADT on Buckman Springs Road is projected to increase to 1,300 vehicles [SANDAG 2012]; in the absence of a project-specific traffic analysis, this projection is considered reasonably equivalent to the existing plus cumulative (near-term) condition.

The project would generate approximately 375 ADT along Buckman Springs Road for an existing plus cumulative plus project condition of 1,675 vehicles. TNM was used to estimate the cumulative noise increase from the existing noise level, using the roadway assumptions listed in Section 2.2.1.1. At 50 feet from the centerline, the existing noise level of 62 dBA generated by the existing ADT of 1,200 vehicles would increase to 63 dBA with the addition of the cumulative and project traffic.

The cumulative plus project traffic noise increase would be 1 dBA. Cumulative traffic noise impacts are less than significant.

### 3.0 PROJECT-GENERATED AIRBORNE NOISE

#### 3.1 Guidelines for the Determination of Significance

It shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property, exceeds the applicable limits on Table 36.404.

The project will generate airborne noise which, together with noise from all sources, will be in excess of either of the following:

- A. Non-Construction Noise: The limit specified in San Diego County Code Section 36.404, General Sound Level Limits, at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise. Section 36.404 provides the following limits:

**San Diego County Code Section 36.404, Sound Level Limits in Decibels (dBA)**

ZONE	TIME	ONE-HOUR AVERAGE SOUND LEVEL LIMITS (dBA)
(1) R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-90, S-92 and R-V and R-U with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) R-RO, R-C, R-M, S-86, V5 and R-V and R-U with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S-94, V-4 and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2 V1, V2 V1 V2	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	55
	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M-50, M-52 and M-54.	Anytime	70
(6) S-82, M-56 and M-58.	Anytime	75
(7) S-88 (see subsection (c) below)		

---

(a) If the measured ambient noise level exceeds the applicable limit stated above, the allowable one hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(b) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is actually located.

(c) S88 zones are Specific Planning Areas which allow for different uses. The sound level limits in Table 36.404 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.

(d) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section, measured at or beyond six feet from the boundary of the easement upon which the facility is located.

## 3.2 Potential Operational Noise Impacts (Non-Construction Noise)

Noise from operation of the proposed project would result from mechanical equipment, including ground-mounted heating / ventilation / air conditioning (HVAC) units. These sources are discussed below.

### 3.2.1 Mechanical Equipment

HVAC units would be installed at ground level adjacent to each new building, including the dormitories, dining hall, and transitional / sober living facility. The locations of the HVAC units are shown on Figure 4 [San Diego Freedom Ranch 2012]. Each unit would be a Trane model 4TWX6024B1000A. This model has a sound power level of 77 dBA and a height of approximately 2 feet. The manufacturer's acoustical specifications are shown in Appendix [BC](#).

Point source calculations were used to calculate project-generated hourly noise levels from the HVAC units. Results of these calculations are shown on Figure 4. Project-generated operational noise levels at project property lines would range from less than 30 dBA Leq to 37 dBA Leq at the southern property line near the transitional / sober living facility, in compliance with County sound level limits. Noise impacts from onsite operations are less than significant.

### 3.2.2 Design Considerations

Design considerations include the layout of the project building pads and mechanical equipment as shown on Figure 4. No mitigation measures were necessary.



---

### **3.3 Construction Activities**

#### **3.3.1 Guidelines for the Determination of Significance**

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Section 36.409, Sound Level Limitations on Construction Equipment.

Section 36.409 states:

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

### **3.4 Potential Noise Impacts**

This project would implement conventional construction techniques and equipment. Specialized construction activities such as pile driving and blasting are not anticipated for this project. No hauling or importing/exporting of dirt is expected. Construction activity and delivery of construction materials and equipment would be limited to the hours between 7:00 a.m. and 7:00 p.m., Monday through Saturday.

#### **3.4.1 Potential Build-out Noise Conditions**

Construction activities at the proposed site would result in a short-term, temporary increase in the ambient noise level. The increase in noise level would be primarily experienced close to the noise source. The primary noise from project construction would be from site preparation. Site preparation includes grading. Grading of the project building pads would be accomplished using one bulldozer [San Diego Freedom Ranch 2012]. Grading would be limited to 8 hours per day at the building pads for dormitories 1-4 and the dining hall, and to 4 hours per day at the building pad for the transitional / sober living facility.

The average sound level of a typical bulldozer is 85 dBA at 50 feet from the source (U.S. Environmental Protection Agency [U.S. EPA] 1971). Acoustical calculations were performed to estimate construction sound levels at the property lines. Noise from the construction equipment was modeled as a point source with a sound pressure level of 85 dBA at 50 feet. The construction noise source was evaluated at four locations: at the center of the dormitory 1 building pad, at the center of the dining hall building pad, at the center of the dormitory 4 building pad, and at the center of the transitional / sober living facility building pad. Distances from these building pad centers to property lines range from 110 to 300 feet.

---

### 3.4.2 Potential Noise Impact Identification

Construction activities would result in noise levels up to 75 dBA at the northwestern property line corner near dormitory 1 and at the southern property line near the transitional / sober living facility, as shown on Figure 5. Construction noise levels at all other property lines would be lower than these worst-case levels.

Construction noise levels would be 75 dBA Leq (8 hours) or less at all property lines and all occupied properties, in compliance with the County Noise Ordinance. Construction noise impacts from the project are less than significant.

### 3.4.3 Design Considerations

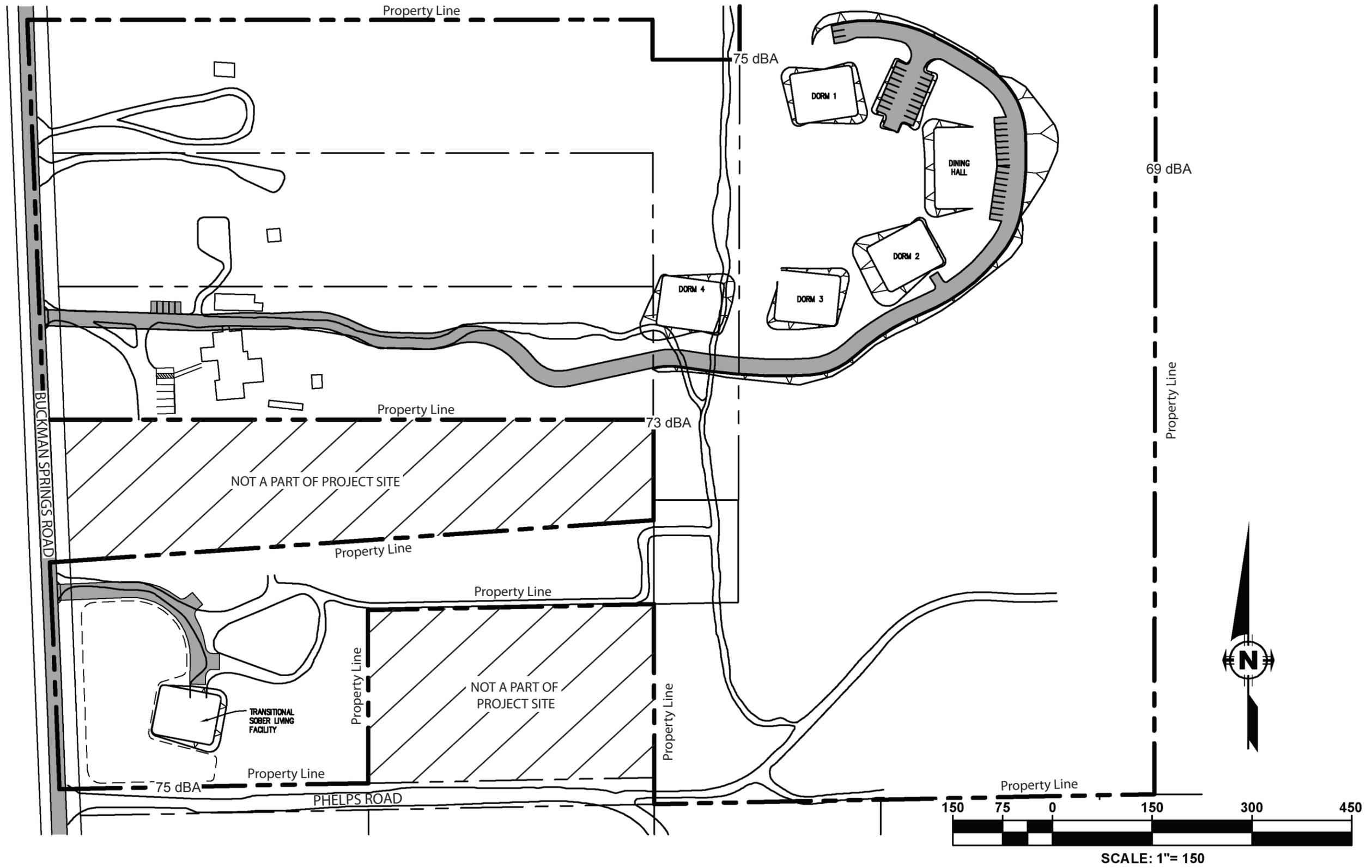
Design considerations include the layout of the project building pads as shown on Figures 3-4, grading of dormitory and dining hall building pads for no more than 8 hours per day, and grading of the transitional / sober living facility building pad for no more than 4 hours per day. No topographical features were considered in the calculations.

## 3.5 Conclusions

Unmitigated construction activities would generate noise levels of 75 dBA Leq (8 hours) or less at the project property lines and at offsite occupied properties. No noise impacts from construction activity would occur.

However, to minimize unnecessary annoyance from construction noise, the construction contractor should be required to comply with all provisions of the County Noise Ordinance (Section 36.409). The following construction noise control measures should be implemented:

- Limit construction activity and delivery of construction materials and equipment to the hours between 7:00 a.m. and 7:00 p.m., Monday through Saturday.
- Prohibit construction and delivery workers from arriving at the site prior to 7:00 a.m.
- Limit construction noise to 75 dBA Leq at the property line of the nearest occupied property.
- Keep construction equipment and vehicles in good repair and fitted with "manufacturer-recommended" mufflers.



---

## 4.0 SUMMARY OF PROJECT IMPACTS, MITIGATION, AND CONCLUSIONS

### 4.1 Project Features

The project would include the following noise-reducing features as design considerations:

- Placement of project building pads as shown on Figures 3-4.
- Placement of mechanical equipment as shown in Figure 4.
- Specification of mechanical equipment as shown in Appendix [BC](#).
- Restriction of dormitory and dining hall building pad grading to 8 hours per day.
- Restriction of transitional / sober living facility building pad grading to 4 hours per day.

These design considerations are necessary to demonstrate compliance with County noise standards.

### 4.2 Noise Sensitive Land Uses

Future exterior traffic noise levels would be less than 60 dBA CNEL at on-site usable open space areas and would be in compliance with the County Noise Element of the General Plan. No impacts were identified. No exterior mitigation measures are required.

Future exterior traffic noise levels would be less than 60 dBA CNEL at residential façades. No potential impacts were identified. No interior noise analysis would be required.

### 4.3 Project-Generated Airborne Noise

Operation of the project would generate less than 45 dBA Leq at all property lines, and would therefore be in compliance with the County Noise Ordinance. No impacts were identified. No mitigation is required.

Construction of the project would generate less than 75 dBA Leq at all project property lines and offsite occupied properties. No impacts were identified. No mitigation is required.

---

## 5.0 REFERENCES

County of San Diego. 2008. Noise Ordinance. December 10.

[2010. GP Update EIR. 2030 Planning Commission Recommended LOS and Volume Plot. Mountain Empire Area. September 3.](#)

2011. General Plan. Part VIII: Noise Element. August 3.

2011. San Diego Freedom Ranch Scoping Letter. November 12.

Federal Highway Administration (FHWA). 2004. Traffic Noise Model, Version 2.5. February.

Harris, Cyril M. 1998. Handbook of Acoustical Measurements and Noise Control, Third Edition. Acoustical Society of America. Woodbury, NY.

International Organization for Standardization (ISO). 1996a. ISO 1996/1. Acoustics – Description and Measurement of Environmental Noise – Part 1: Basic Quantities and Procedures.

1996b. ISO 1996-2. Acoustics – Description and Measurement of Environmental Noise – Part 2: Acquisition of Data Pertinent to Land Use.

1996c. ISO 1996-3. Acoustics – Description and Measurement of Environmental Noise – Part 3: Application to Noise Limits.

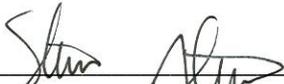
Pacific Traffic Data Services. 2010. Traffic counts for Buckman Springs Road and San Diego Freedom Ranch driveway. October 21.

San Diego Association of Governments. 2012. Traffic counts and projections for Buckman Springs Road.

San Diego Freedom Ranch. 2012. Major Use Permit Sheet Set. January 25.

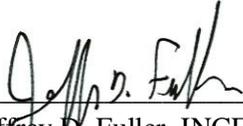
---

## 6.0 LIST OF PREPARERS



---

Steve Fiedler, INCE  
Project Acoustician



---

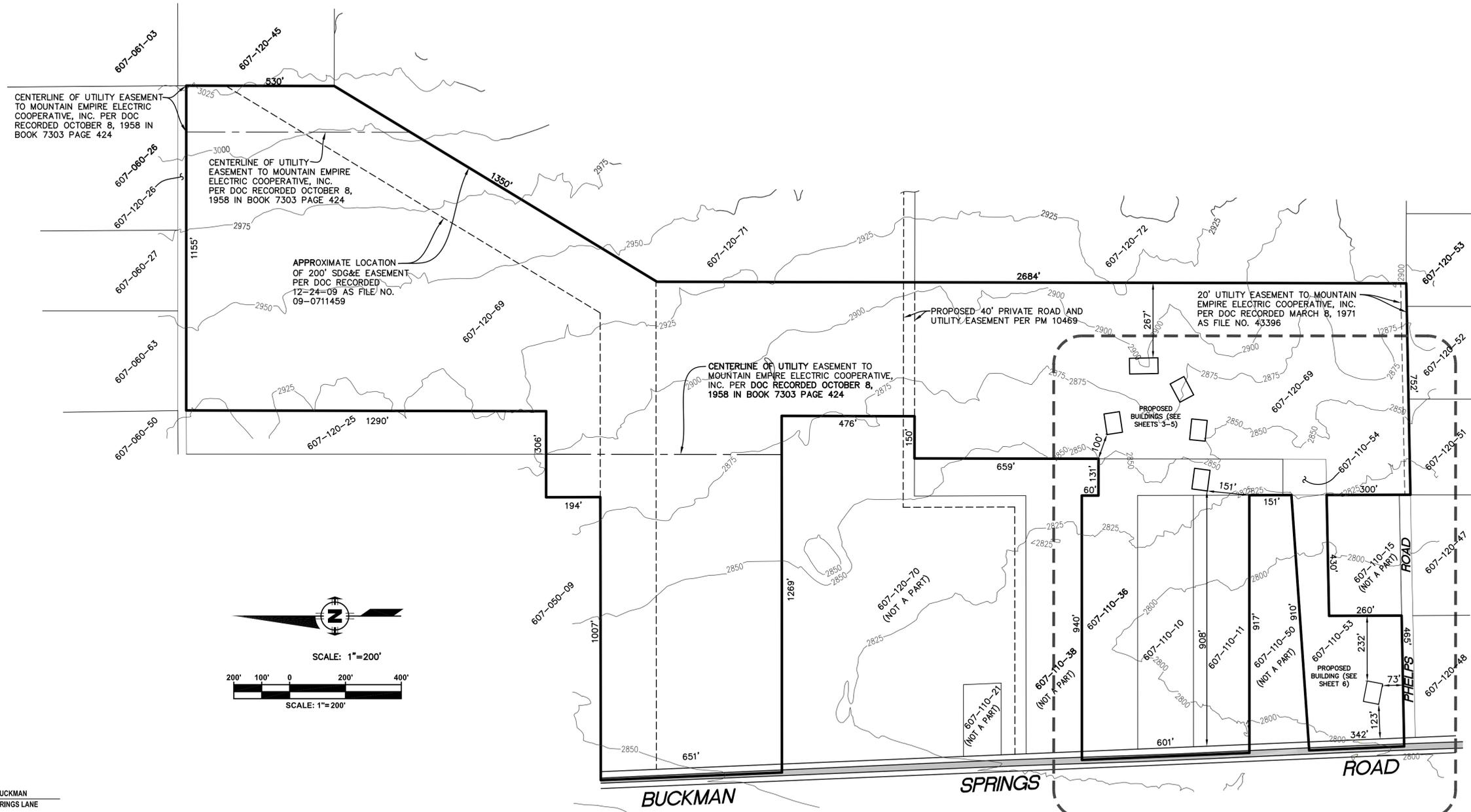
Jeffrey D. Fuller, INCE, REHS  
Senior Project Manager





# MAJOR USE PERMIT P74-011W - MODIFICATION

## SAN DIEGO FREEDOM RANCH



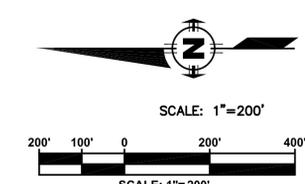
**ABBREVIATED LEGAL DESCRIPTION**  
 PARCEL "B" OF BOUNDARY ADJUSTMENT B/C 10-0034 RECORDED SEPTEMBER 2, 2010 AS DOC. NO. 2010-0462297.  
 TOGETHER WITH THE SOUTH HALF OF LOT 3, SEC 33, T17E, R5E, SAN BERNARDINO MERIDIAN, ACCORDING TO THE INDEPENDENT RESURVEY OF SAID TOWNSHIP  
 TOGETHER WITH THE SOUTH 600 FEET OF THE NORTH 4670.28 FEET OF TRACT 58 AS SHOWN ON MAP OF THE UNITED STATES GOVERNMENT INDEPENDENT RESURVEY OF TOWNSHIP 17 SOUTH, R5E, SAN BERNARDINO MERIDIAN APPROVED MAY 23, 1921

**TOTAL GROSS ACREAGE = 112.6 AC**

**EASEMENT NOTE**  
 ALL EASEMENTS HAVE BEEN PLOTTED PER CHICAGO TITLE REPORT ORDER NUMBERS 608025037-P05 AND 980002470-P01 DATED 10-24-08 AND 12-24-09, RESPECTIVELY.  
 MOUNTAIN EMPIRE ELECTRIC COOPERATIVE, INC. EASEMENT FOR TRANSMISSION OR DISTRIBUTION LINES RECORDED 3-8-71 AS FILE NO. 43397 IS NOT PLOTTABLE, I.E. NO SPECIFIC LOCATION WITHIN THE PROPERTY IS GIVEN

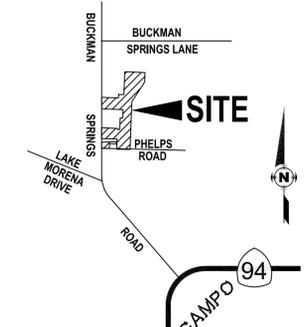
**ASSESSOR PARCEL NUMBERS:**  
 607-110-10, 11, 36, 53, & 54 AND 607-120-69

**OWNER:**  
 SAN DIEGO FREEDOM RANCH, INC.  
 1777 BUCKMAN SPRINGS ROAD  
 CAMPO, CA 91906  
 619-478-5696



**AREA OF PROPOSED IMPROVEMENTS (SEE FOLLOWING PAGES). REMAINDER OF LAND PRESERVED FOR WATERSHED PROTECTION IN ORDER TO ASSURE ADEQUATE WATER SUPPLY FOR THE EXISTING FACILITIES AND PROPOSED EXPANSION OF SAN DIEGO FREEDOM RANCH.**

REVISION BLOCK		
NO.	DATE	DESCRIPTION
1	8-24-10	ORIGINAL - FOR PRE-APP. SUBMITTAL
2	4-29-11	ADD STRUCTURE CHART, UPDATE APNS
3	1-25-12	MOVED PROPOSED BUILDINGS AWAY FROM SENSITIVE PLANTS



**PREPARED BY:**  
 LAWRENCE W. WALSH RCE 46316 DATE \_\_\_\_\_

**Walsh Engineering & Surveying, Inc.**  
 607 Aldwych Road, El Cajon, CA 92020  
 (619) 588-6747 (619) 792-1232 Fax

FREEDOM RANCH - M.U.P. TITLE SHEET

# EXISTING CONDITIONS

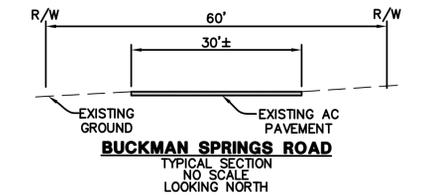
SAN DIEGO FREEDOM RANCH - MAJOR USE PERMIT P74-011W - MODIFICATION

SHEET 2 OF 8



### STRUCTURE LEGEND:

	DESCRIPTION	AREA	HEIGHT
(1)	MAIN FACILITY	5,926 SF	15 FT 2 IN
(2)	MULTI-PURPOSE ROOM	1,800 SF	12 FT 10 IN
(3)	STORAGE ROOM	368 SF	9 FT
(4)	STORAGE SHED	83 SF	10 FT 6 IN
(5)	WALK-IN COOLER	304 SF	13 FT
(6)	DRY STORAGE	510 SF	10 FT 6 IN
(7)	OUTDOOR KITCHEN	300 SF	12 FT 8 IN
(8)	WELL SHED	48 SF	11 FT 3 IN
(9)	DUCK SHED	180 SF	7 FT 8 IN
(10)	ABANDONED PIG SHED	528 SF	15 FT
(11)	STAFF QUARTERS	320 SF	14 FT 8 IN
(12)	GARDENING SHED	64 SF	7 FT
(13)	GAZEBO	224 SF	10 FT
(14)	TRAILER	690 SF	9 FT 6 IN
(15)	COTTAGE	140 SF	11 FT
(16)	FRUIT STAND	96 SF	11 FT
(17)	GARAGE	576 SF	12 FT 6 IN
(18)	HOUSE	1,192 SF	13 FT
(19)	WORKSHOP	576 SF	15 FT
(20)	BARN	900 SF	24 FT
(21)	GARDENING SHED	200 SF	7 FT 7 IN
(22)	WELL SHED	64 SF	12 FT



SCALE: 1"=80'



BUCKMAN

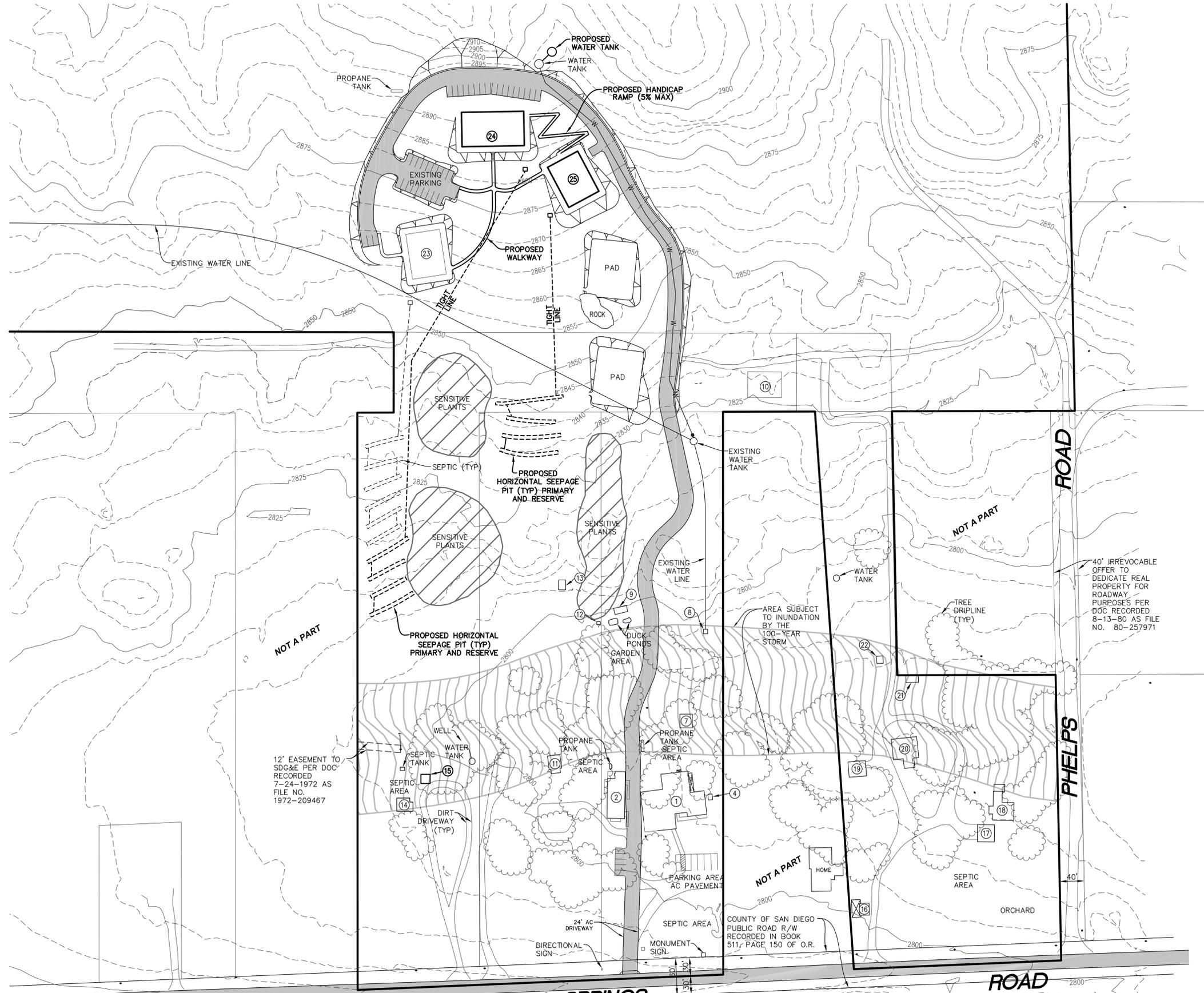
SPRINGS

ROAD

FREEDOM RANCH - EXISTING CONDITIONS

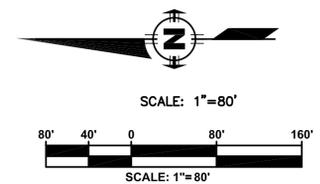


# PHASE 2



**STRUCTURE LEGEND:**

#	USE	AREA	HEIGHT	DESCRIPTION
(1)	MAIN FACILITY	5,926 SF	15 FT 2 IN	EXTERIOR ROOM TO BE REMOVED, CONVERTED TO WHAT-LAURIE? AND EXPANDED ___ SF DURING PHASE 1
(2)	MULTI-PURPOSE ROOM	1,800 SF	12 FT 10 IN	RELOCATE ADA ACCESSES DURING PHASE 1
(3)	STORAGE ROOM	368 SF	9 FT	REMOVED DURING PHASE 1
(4)	STORAGE SHED	83 SF	10 FT 6 IN	REMOVED DURING PHASE 1
(5)	WALK-IN COOLER	304 SF	13 FT	REMOVED DURING PHASE 1
(6)	DRY STORAGE	510 SF	10 FT 6 IN	REMOVED DURING PHASE 1
(7)	OUTDOOR KITCHEN	300 SF	12 FT 8 IN	
(8)	WELL SHED	48 SF	11 FT 3 IN	
(9)	DUCK SHED	180 SF	7 FT 8 IN	
(10)	ABANDONED PIG SHED	528 SF	15 FT	RELOCATED DURING PHASE 1
(11)	STAFF QUARTERS	320 SF	14 FT 8 IN	
(12)	GARDENING SHED	64 SF	7 FT	
(13)	GAZEBO	224 SF	10 FT	
(14)	TRAILER	690 SF	9 FT 6 IN	
(15)	COTTAGE	140 SF	11 FT	REMOVED DURING PHASE 2
(16)	FRUIT STAND	96 SF	11 FT	
(17)	GARAGE	576 SF	12 FT 6 IN	
(18)	HOUSE	1,192 SF	13 FT	
(19)	WORKSHOP	576 SF	15 FT	
(20)	BARN	900 SF	24 FT	
(21)	GARDENING SHED	200 SF	7 FT 7 IN	
(22)	WELL SHED	64 SF	12 FT	
23	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 1
24	DINING HALL	5,712 SF	24 FT 8 IN	CONSTRUCTED DURING PHASE 2
25	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 2

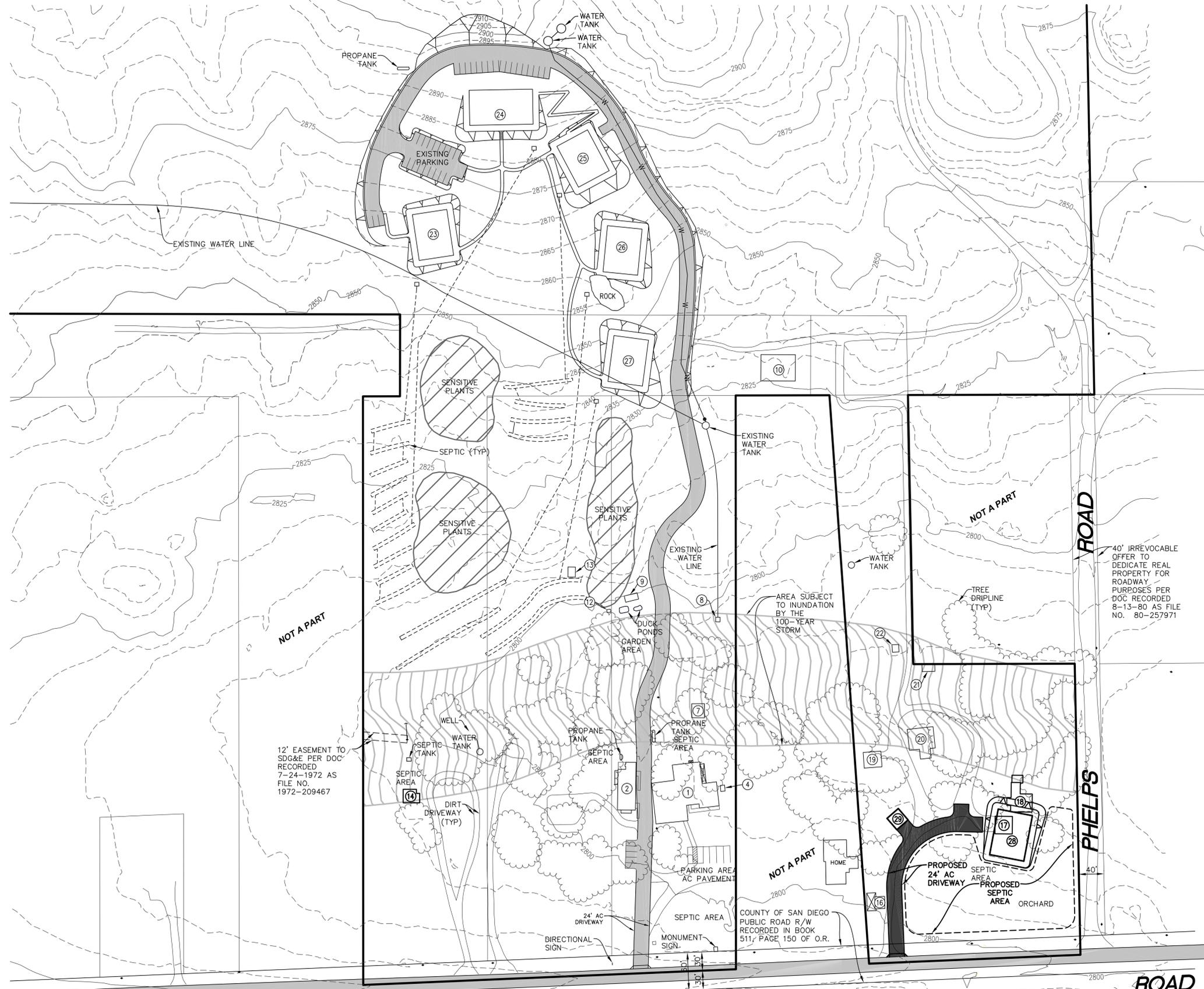


**Walsh Engineering & Surveying, Inc.**  
 607 Aldwych Road, El Cajon, CA 92020  
 (619) 588-6747 (619) 792-1232 Fax

FREEDOM RANCH - PHASE 2



# PHASE 4



**STRUCTURE LEGEND:**

#	USE	AREA	HEIGHT	DESCRIPTION
(1)	MAIN FACILITY	5,926 SF	15 FT 2 IN	EXTERIOR ROOM TO BE REMOVED, CONVERTED TO WHAT-LAURE? AND EXPANDED ___ SF DURING PHASE 1, CONVERTED TO STAFF QUARTERS AND ADMIN. FACILITY DURING PHASE 3
(2)	MULTI-PURPOSE ROOM	1,800 SF	12 FT 10 IN	RELOCATE ADA ACCESSES DURING PHASE 1
(3)	STORAGE ROOM	368 SF	9 FT	REMOVED DURING PHASE 1
(4)	STORAGE SHED	83 SF	10 FT 6 IN	
(5)	WALK-IN COOLER	304 SF	13 FT	REMOVED DURING PHASE 1
(6)	DRY STORAGE	510 SF	10 FT 6 IN	REMOVED DURING PHASE 1
(7)	OUTDOOR KITCHEN	300 SF	12 FT 8 IN	
(8)	WELL SHED	48 SF	11 FT 3 IN	
(9)	DUCK SHED	180 SF	7 FT 8 IN	
(10)	ABANDONED PIG SHED	528 SF	15 FT	RELOCATED DURING PHASE 1
(11)	STAFF QUARTERS	320 SF	14 FT 8 IN	REMOVED DURING PHASE 3
(12)	GARDENING SHED	64 SF	7 FT	
(13)	GAZEBO	224 SF	10 FT	
(14)	TRAILER	690 SF	9 FT 6 IN	REMOVED DURING PHASE 4
(15)	COTTAGE	140 SF	11 FT	REMOVED DURING PHASE 2
(16)	FRUIT STAND	96 SF	11 FT	
(17)	GARAGE	576 SF	12 FT 6 IN	REMOVED DURING PHASE 4
(18)	HOUSE	1,192 SF	13 FT	REMOVED DURING PHASE 4
(19)	WORKSHOP	576 SF	15 FT	
(20)	BARN	900 SF	24 FT	
(21)	GARDENING SHED	200 SF	7 FT 7 IN	
(22)	WELL SHED	64 SF	12 FT	
23	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 1
24	DINING HALL	5,712 SF	24 FT 8 IN	CONSTRUCTED DURING PHASE 2
25	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 2
26	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 3
27	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 3
28	DORMATORY	4,144 SF	22 FT	CONSTRUCTED DURING PHASE 4
29	2-CAR GARAGE	-- SF	-- FT	CONSTRUCTED DURING PHASE 4



SCALE: 1"=80'



SCALE: 1"=80'

**Walsh Engineering & Surveying, Inc.**  
607 Aldwych Road, El Cajon, CA 92020  
(619) 588-6747 (619) 792-1232 Fax

BUCKMAN

SPRINGS

ROAD

FREEDOM RANCH - PHASE 4

---

**APPENDIX B**  
**ROADWAY NOISE CALCULATIONS**

**INPUT: ROADWAYS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.				19 November 2012							
SPF				TNM 2.5							
<b>INPUT: ROADWAYS</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>							
<b>PROJECT/CONTRACT:</b>		Freedom Ranch									
<b>RUN:</b>		Measured									
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>		<b>Segment</b>		
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
Buckman Springs	12.0	point1	1	-1,000.0	-6.0	0.00				Average	
		point2	2	1,000.0	-6.0	0.00				Average	
		point3	3	1,000.0	6.0	0.00				Average	
		point4	4	-1,000.0	6.0	0.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.		19 November 2012										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Measured										
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Buckman Springs	point1	1	120	55	0	0	6	55	0	0	0	0
	point2	2	0	0	0	0	0	0	0	0	0	0
	point3	3	66	55	8	55	0	0	6	55	0	0
	point4	4										

**INPUT: RECEIVERS**

**Freedom Ranch**

							19 November 2012				
Kimley-Horn and Associates, Inc.							TNM 2.5				
SPF											
INPUT: RECEIVERS											
PROJECT/CONTRACT:		Freedom Ranch									
RUN:		Measured									
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active
			X	Y	Z	above	Existing	Impact Criteria		NR	in
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	Calc.
			ft	ft	ft	ft	dBA	dBA	dB	dB	
ML	1	1	0.0	150.0	0.00	4.92	0.00	66	10.0	8.0	Y

**RESULTS: SOUND LEVELS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.													19 November 2012		
SPF													TNM 2.5		
													Calculated with TNM 2.5		
<b>RESULTS: SOUND LEVELS</b>															
<b>PROJECT/CONTRACT:</b>			Freedom Ranch												
<b>RUN:</b>			Measured												
<b>BARRIER DESIGN:</b>			INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.						
<b>ATMOSPHERICS:</b>			68 deg F, 50% RH												
<b>Receiver</b>															
<b>Name</b>		<b>No.</b>	<b>#DUs</b>	<b>Existing LAeq1h</b>	<b>No Barrier LAeq1h</b>			<b>Increase over existing</b>		<b>Type</b>	<b>With Barrier</b>		<b>Noise Reduction</b>		
					<b>Calculated</b>	<b>Crit'n</b>	<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>Calculated LAeq1h</b>	<b>Calculated</b>	<b>Goal</b>	<b>Calculated minus Goal</b>		
				dB	dB	dB	dB	dB		dB	dB	dB	dB		
ML		1	1	0.0	53.9	66	53.9	10	----	53.9	0.0	8	-8.0		
<b>Dwelling Units</b>			<b># DUs</b>	<b>Noise Reduction</b>											
				<b>Min</b>	<b>Avg</b>	<b>Max</b>									
				<b>dB</b>	<b>dB</b>	<b>dB</b>									
All Selected			1	0.0	0.0	0.0									
All Impacted			0	0.0	0.0	0.0									
All that meet NR Goal			0	0.0	0.0	0.0									

**INPUT: ROADWAYS**

**Freedom Ranch**

				19 November 2012							
Kimley-Horn and Associates, Inc.				TNM 2.5							
SPF											
<b>INPUT: ROADWAYS</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>							
<b>PROJECT/CONTRACT:</b>		Freedom Ranch									
<b>RUN:</b>		Future									
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>		<b>Segment</b>		
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
Buckman Springs	12.0	point1	1	-1,000.0	-6.0	0.00				Average	
		point2	2	1,000.0	-6.0	0.00				Average	
		point3	3	1,000.0	6.0	0.00				Average	
		point4	4	-1,000.0	6.0	0.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.		19 November 2012										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Future										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Buckman Springs	point1	1	140	55	6	55	5	55	5	55	0	0
	point2	2	140	55	6	55	5	55	5	55	0	0
	point3	3	140	55	6	55	5	55	5	55	0	0
	point4	4										

**INPUT: RECEIVERS**

**Freedom Ranch**

							19 November 2012					
Kimley-Horn and Associates, Inc.							TNM 2.5					
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Future										
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z		above	Existing	Impact Criteria			NR
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	in	
			ft	ft	ft	ft	dBA	dBA	dB	dB	Calc.	
Pad	1	1	0.0	130.0	0.00	4.92	0.00	66	10.0	8.0	Y	
60 dBA CNEL	2	1	0.0	95.0	0.00	4.92	0.00	66	10.0	8.0	Y	

**RESULTS: SOUND LEVELS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.													19 November 2012	
SPF													TNM 2.5	
													Calculated with TNM 2.5	
<b>RESULTS: SOUND LEVELS</b>														
<b>PROJECT/CONTRACT:</b>			Freedom Ranch											
<b>RUN:</b>			Future											
<b>BARRIER DESIGN:</b>			INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
<b>ATMOSPHERICS:</b>			68 deg F, 50% RH											
<b>Receiver</b>														
<b>Name</b>		<b>No.</b>	<b>#DUs</b>	<b>Existing LAeq1h</b>	<b>No Barrier</b>			<b>Increase over existing</b>		<b>Type</b>	<b>With Barrier</b>			
					<b>LAeq1h</b>	<b>Crit'n</b>	<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>Calculated LAeq1h</b>	<b>Noise Reduction</b>			
								<b>Sub'l Inc</b>			<b>Calculated</b>	<b>Goal</b>	<b>Calculated minus Goal</b>	
				dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	
Pad		1	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0	
60 dBA CNEL		2	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0	
<b>Dwelling Units</b>			<b># DUs</b>	<b>Noise Reduction</b>										
				<b>Min</b>	<b>Avg</b>	<b>Max</b>								
				<b>dB</b>	<b>dB</b>	<b>dB</b>								
All Selected			2	0.0	0.0	0.0								
All Impacted			0	0.0	0.0	0.0								
All that meet NR Goal			0	0.0	0.0	0.0								

**INPUT: ROADWAYS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.				19 November 2012							
SPF				TNM 2.5							
<b>INPUT: ROADWAYS</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>							
<b>PROJECT/CONTRACT:</b>		Freedom Ranch									
<b>RUN:</b>		Existing									
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>		<b>Segment</b>		
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
Buckman Springs	12.0	point1	1	-1,000.0	-6.0	0.00				Average	
		point2	2	1,000.0	-6.0	0.00				Average	
		point3	3	1,000.0	6.0	0.00				Average	
		point4	4	-1,000.0	6.0	0.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.		19 November 2012										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Existing										
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Buckman Springs	point1	1	54	55	2	55	2	55	2	55	0	0
	point2	2	0	0	0	0	0	0	0	0	0	0
	point3	3	54	55	2	55	2	55	2	55	0	0
	point4	4										

**INPUT: RECEIVERS**

**Freedom Ranch**

							19 November 2012					
Kimley-Horn and Associates, Inc.							TNM 2.5					
SPF												
INPUT: RECEIVERS												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Existing										
Receiver												
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active	
			X	Y	Z		above	Existing	Impact Criteria			NR
						Ground	L <sub>Aeq</sub> 1h	L <sub>Aeq</sub> 1h	Sub'l	Goal	in	
			ft	ft	ft	ft	dBA	dBA	dB	dB	Calc.	
50'	1	1	0.0	50.0	0.00	4.92	0.00	66	10.0	8.0	Y	

**RESULTS: SOUND LEVELS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.													19 November 2012	
SPF													TNM 2.5	
													Calculated with TNM 2.5	
<b>RESULTS: SOUND LEVELS</b>														
<b>PROJECT/CONTRACT:</b>			Freedom Ranch											
<b>RUN:</b>			Existing											
<b>BARRIER DESIGN:</b>			INPUT HEIGHTS						Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.					
<b>ATMOSPHERICS:</b>			68 deg F, 50% RH											
<b>Receiver</b>														
<b>Name</b>		<b>No.</b>	<b>#DUs</b>	<b>Existing LAeq1h</b>	<b>No Barrier LAeq1h</b>			<b>Increase over existing</b>		<b>Type</b>	<b>With Barrier</b>			
					<b>Calculated</b>	<b>Crit'n</b>	<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>Calculated LAeq1h</b>	<b>Noise Reduction</b>			
								<b>Sub'l Inc</b>			<b>Calculated</b>	<b>Goal</b>	<b>Calculated minus Goal</b>	
				dB	dB	dB	dB	dB		dB	dB	dB	dB	
50'		1	1	0.0	61.6	66	61.6	10	----	61.6	0.0	8	-8.0	
<b>Dwelling Units</b>			<b># DUs</b>	<b>Noise Reduction</b>										
				<b>Min</b>	<b>Avg</b>	<b>Max</b>								
				<b>dB</b>	<b>dB</b>	<b>dB</b>								
All Selected			1	0.0	0.0	0.0								
All Impacted			0	0.0	0.0	0.0								
All that meet NR Goal			0	0.0	0.0	0.0								

**INPUT: ROADWAYS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.				19 November 2012							
SPF				TNM 2.5							
<b>INPUT: ROADWAYS</b>				<b>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</b>							
<b>PROJECT/CONTRACT:</b>		Freedom Ranch									
<b>RUN:</b>		Existing + Project									
<b>Roadway</b>		<b>Points</b>									
<b>Name</b>	<b>Width</b>	<b>Name</b>	<b>No.</b>	<b>Coordinates (pavement)</b>			<b>Flow Control</b>		<b>Segment</b>		
				<b>X</b>	<b>Y</b>	<b>Z</b>	<b>Control Device</b>	<b>Speed Constraint</b>	<b>Percent Vehicles Affected</b>	<b>Pvmt Type</b>	<b>On Struct?</b>
	ft			ft	ft	ft		mph	%		
Buckman Springs	12.0	point1	1	-1,000.0	-6.0	0.00				Average	
		point2	2	1,000.0	-6.0	0.00				Average	
		point3	3	1,000.0	6.0	0.00				Average	
		point4	4	-1,000.0	6.0	0.00					

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.		19 November 2012										
SPF		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		Freedom Ranch										
RUN:		Existing + Project										
Roadway	Points											
Name	Name	No.	Segment									
			Autos		MTrucks		HTrucks		Buses		Motorcycles	
			V	S	V	S	V	S	V	S	V	S
			veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Buckman Springs	point1	1	75	55	3	55	3	55	3	55	0	0
	point2	2	0	0	0	0	0	0	0	0	0	0
	point3	3	75	55	3	55	3	55	3	55	0	0
	point4	4										

**INPUT: RECEIVERS**

**Freedom Ranch**

							19 November 2012					
Kimley-Horn and Associates, Inc.							TNM 2.5					
SPF												
<b>INPUT: RECEIVERS</b>												
<b>PROJECT/CONTRACT:</b>		Freedom Ranch										
<b>RUN:</b>		Existing + Project										
<b>Receiver</b>												
<b>Name</b>	<b>No.</b>	<b>#DUs</b>	<b>Coordinates (ground)</b>			<b>Height</b>	<b>Input Sound Levels and Criteria</b>				<b>Active</b>	
			<b>X</b>	<b>Y</b>	<b>Z</b>	<b>above</b>	<b>Existing</b>	<b>Impact Criteria</b>		<b>NR</b>	<b>in</b>	
						<b>Ground</b>	<b>LAeq1h</b>	<b>LAeq1h</b>	<b>Sub'l</b>	<b>Goal</b>	<b>Calc.</b>	
			ft	ft	ft	ft	dBA	dBA	dB	dB		
50'	1	1	0.0	50.0	0.00	4.92	0.00	66	10.0	8.0	Y	

**RESULTS: SOUND LEVELS**

**Freedom Ranch**

Kimley-Horn and Associates, Inc.													19 November 2012	
SPF													TNM 2.5	
													Calculated with TNM 2.5	
<b>RESULTS: SOUND LEVELS</b>														
<b>PROJECT/CONTRACT:</b>			Freedom Ranch											
<b>RUN:</b>			Existing + Project											
<b>BARRIER DESIGN:</b>			INPUT HEIGHTS											
													Average pavement type shall be used unless	
													a State highway agency substantiates the use	
<b>ATMOSPHERICS:</b>													68 deg F, 50% RH	
<b>Receiver</b>														
<b>Name</b>		<b>No.</b>	<b>#DUs</b>	<b>Existing LAeq1h</b>	<b>No Barrier LAeq1h</b>			<b>Increase over existing</b>		<b>Type</b>	<b>With Barrier</b>			
					<b>Calculated</b>	<b>Crit'n</b>	<b>Calculated</b>	<b>Crit'n</b>	<b>Impact</b>	<b>Calculated LAeq1h</b>	<b>Noise Reduction</b>			
								<b>Sub'l Inc</b>			<b>Calculated</b>	<b>Goal</b>	<b>Calculated minus Goal</b>	
				dB	dB	dB	dB	dB		dB	dB	dB	dB	
50'		1	1	0.0	63.2	66	63.2	10	----	63.2	0.0	8	-8.0	
<b>Dwelling Units</b>			<b># DUs</b>	<b>Noise Reduction</b>										
				<b>Min</b>	<b>Avg</b>	<b>Max</b>								
				<b>dB</b>	<b>dB</b>	<b>dB</b>								
All Selected			1	0.0	0.0	0.0								
All Impacted			0	0.0	0.0	0.0								
All that meet NR Goal			0	0.0	0.0	0.0								

---

**APPENDIX C**  
**MECHANICAL EQUIPMENT**



**TRANE®**

# Split System Heat Pump Product & Performance Data

---

**XL16i**  
**4TWX6024,036,048 & 060B**

**2,3,4 & 5 Tons**



---

**PUB. NO. 22-1754-05A**



# General Data

## 4TWX6024B1000A

OUTDOOR UNIT ①②	4TWX6024B1000A
<b>SOUND RATING (DECIBELS) ②</b>	77
<b>POWER CONNS. — V/PH/Hz ③</b>	230/1/60
MIN. BRCH. CIR. AMPACITY	13
BR. CIR. } MAX. (AMPS)	20
PROT. RTG. } MIN. (AMPS)	20
<b>COMPRESSOR</b>	CLIMATUFF® - SCROLL
NO. USED - NO. SPEEDS	1 - 2
VOLTS/PH/Hz	230/1/60
R.L. AMPS ⑦ - L.R. AMPS	10.3 - 52
FACTORY INSTALLED	
START COMPONENTS ⑧	NO
INSULATION/SOUND BLANKET	YES
COMPRESSOR HEAT	YES
<b>OUTDOOR FAN — TYPE</b>	PROPELLER
DIA. (IN.) - NO. USED	23 - 1
TYPE DRIVE - NO. SPEEDS	DIRECT - 2
CFM @ 0.0 IN. W.G. ④	2700
NO. MOTORS - HP.	1 - 1/15
MOTOR SPEED R.P.M.	825
VOLTS/PH/Hz	200/230/1/60
FL. AMPS	0.60
<b>OUTDOOR COIL — TYPE</b>	SPINE FIN™
ROWS - F.P.I.	1 - 24
FACE AREA (SQ. FT.)	21.20
TUBE SIZE (IN.)	5/16
REFRIGERANT CONTROL	EXPANSION VALVE
<b>REFRIGERANT</b>	R-410A
(O.D. UNIT) NP CHR. ⑤	5/12-LB/OZ
FACTORY SUPPLIED	YES
LINE SIZE - IN. O.D. GAS ⑥	5/8
LINE SIZE - IN. O.D. LIQ. ⑥	5/16
<b>FCCV</b>	
RESTRICTOR ORIFICE SIZE	N/A
<b>DIMENSIONS</b>	H X W X D
OUTDOOR UNIT CRATED (IN.)	47.6 X 30.1 X 33
UNCRATED	SEE OUTLINE DWG.
<b>WEIGHT</b>	
SHIPPING (LBS.)	266
NET (LBS.)	229

- ① CERTIFIED IN ACCORDANCE WITH THE AIR-SOURCE UNITARY HEAT PUMP EQUIPMENT CERTIFICATION PROGRAM, WHICH IS BASED ON A.R.I. STANDARD 210/240.
- ② RATED IN ACCORDANCE WITH A.R.I. STANDARD 270/SECTION 5.3.6.
- ③ CALCULATED IN ACCORDANCE WITH NATIONAL ELECTRIC CODE. ONLY USE HACR CIRCUIT BREAKERS OR FUSES.
- ④ STANDARD AIR - DRY COIL - OUTDOOR
- ⑤ THIS VALUE APPROXIMATE. FOR MORE PRECISE VALUE SEE UNIT NAMEPLATE AND SERVICE INSTRUCTION.
- ⑥ MAX. LINEAR LENGTH: 80 FT. MAX. LIFT - SUCTION 25 FT; MAX LIFT - LIQUID 25 FT. FOR GREATER LENGTH REFER TO REFRIGERANT PIPING SOFTWARE PUB. NO. 32-3312-01.
- ⑦ THE VALUE SHOWN FOR COMPRESSOR RLA ON THE UNIT NAMEPLATE AND ON THIS SPECIFICATION SHEET IS USED TO COMPUTE MINIMUM BRANCH CIRCUIT AMPACITY AND MAXIMUM FUSE SIZE. THE VALUE SHOWN IS THE BRANCH CIRCUIT SELECTION CURRENT.
- ⑧ NO MEANS NO START COMPONENTS  
YES MEANS QUICK START KIT COMPONENTS  
PTC MEANS POSITIVE TEMPERATURE COEFFICIENT STARTER.



SPLIT SYSTEM



# Dimensions

**4TWX6 Outline Drawing**  
NOTE: ALL DIMENSIONS ARE IN MM (INCHES)

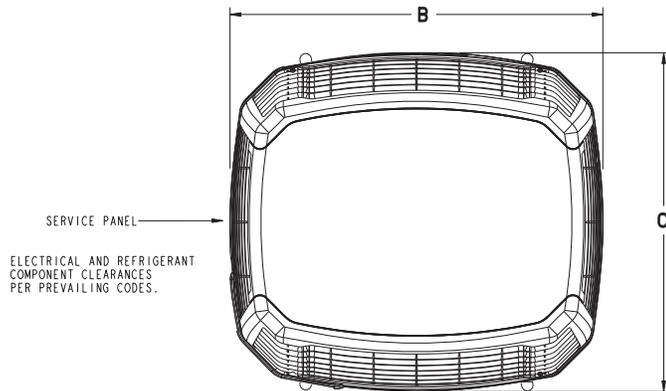
## LEGEND

COLOR OF WIRE		
BK/BL	BLACK WIRE WITH BLUE MARKER	
COLOR OF MARKER		
BK	OR	YL
BL	RD	GR
BR	WH	PR
BLACK	ORANGE	YELLOW
BLUE	RED	GREEN
BROWN	WHITE	PURPLE

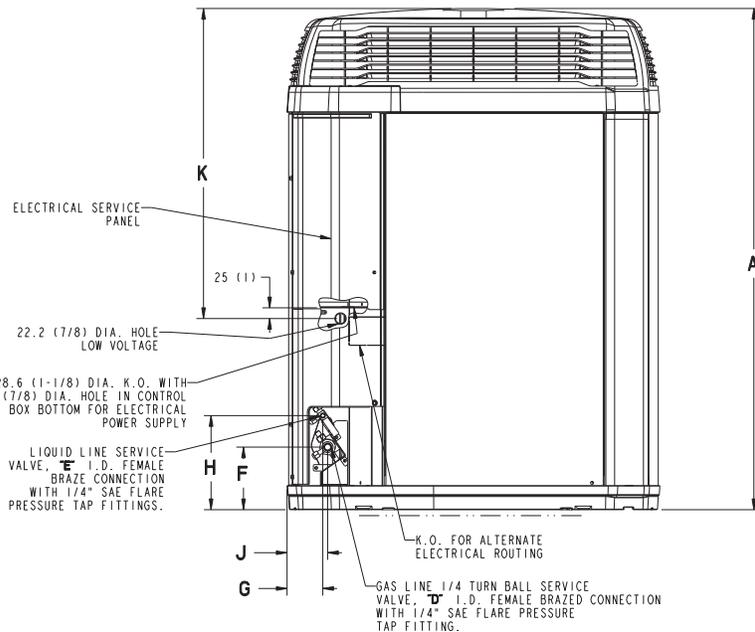
## SYMBOLS

	24 V. LINE V.	} FACTORY WIRING
	24 V. LINE V.	
	GROUND	} FIELD WIRING
	JUNCTION	
	WIRE NUT OR CONNECTOR	
	COIL	
	CAPACITOR	
	RELAY CONTACT (N.O.)	
	RELAY CONTACT (N.C.)	
	THERMISTOR	
	INTERNAL OVERLOAD PROTECTOR	
	PRESSURE ACTUATED SWITCH	
	TEMP. ACTUATED SWITCH	
	POL. PLUG FEMALE HOUSING (MALE TERM.)	
	POL. PLUG MALE HOUSING (FEMALE TERM.)	
	RESISTOR OR HEATING ELEMENT	
	MOTOR WINDING	
	TERMINAL	

CA	COOLING ANTICIPATOR	LPCO	LOW PRESSURE CUTOFF SW.
CBS	COIL BOTTOM SENSOR	MS	COMPRESSOR MOTOR CONTACTOR
CF	FAN CAPACITOR	ODA	OUTDOOR ANTICIPATOR
CM	WIRE CONNECTOR	OFT	OUTDOOR FAN THERMOSTAT
CPR	COMPRESSOR RUN CAPACITOR	ODS	OUTDOOR TEMPERATURE SENSOR
CR	STARTING CAPACITOR	ODT	OUTDOOR THERMOSTAT
CS	CAPACITOR SWITCHING RELAY	RHS	RESISTANCE HEAT SWITCH
CSR	CAPACITOR SWITCHING RELAY	SC	SWITCHOVER VALVE SOLENOID
DFC	DEFROST CONTROL	SM	SYSTEM "ON-OFF" SWITCH
F	INDOOR FAN RELAY	TDL	DISCHARGE LINE THERMOSTAT
HA	HEATING ANTICIPATOR	TNS	TRANSFORMER
HPCO	HIGH PRESSURE CUTOFF SW.	TS	HEATING-COOLING THERMOSTAT
IOL	INTERNAL OVERLOAD PROTECTOR	TSH	HEATING THERMOSTAT
ACR	A/C RECTIFIER		



UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT, AND SHOULD BE AT LEAST 305 (12") FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED.



MODELS	BASE	A	B	C	D	E	F	G	H	J	K
4TWX6024A	3	1118 (44)	829 (32-5/8)	756 (29-3/4)	5/8	5/16	143 (5-5/8)	92 (3-5/8)	210 (8-1/4)	79 (3-1/8)	692 (27-1/4)
4TWX6036A	4	1165 (45-7/8)	946 (37-1/4)	870 (34-1/4)	3/4	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	730 (28-3/4)
4TWX6048A	4	1267 (49-7/8)	946 (37-1/4)	870 (34-1/4)	7/8	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	730 (28-3/4)
4TWX6060A	4	1267 (49-7/8)	946 (37-1/4)	870 (34-1/4)	7/8	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	730 (28-3/4)

From Dwg. 21D152635 Rev. 10